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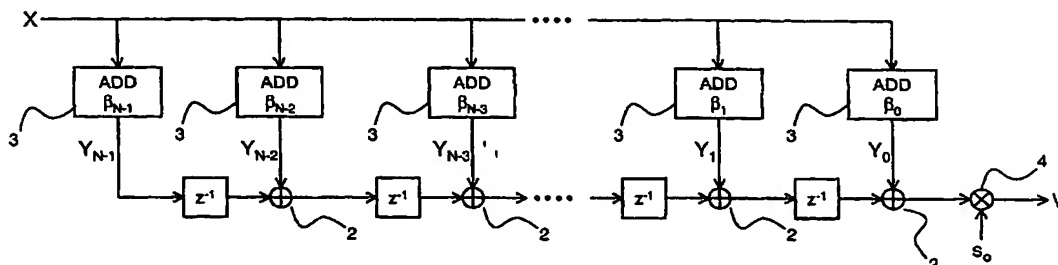
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ning of each regular issue of the PCT Gazette.

(54) Title: METHOD FOR DETERMINING FILTER COEFFICIENTS OF A DIGITAL FILTER AND DIGITAL FILTER



(57) Abstract: In a method for determining filter coefficients of a digital filter, particularly in UMTS, the predetermined filter coefficients b_v are divided by a same scaling factor s and then quantized in that counted from the most significant bit onwards only a certain number n of "1" bits is used and in that the quantization error $E(s)$ is minimized by the selection of the scaling factor s_0 and these scaled and quantized filter coefficients b_v are implemented in the filter.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 766 388 A (SAMSUNG ELECTRONICS CO LTD) 2 April 1997 (1997-04-02) abstract page 2, line 19 - line 38 page 6, line 26 - line 31 page 6, line 54 -page 8, line 5; figures 2,3 page 9, line 24 -page 10, line 12; figure 6 --- -/--	1-10

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>HENRY SAMUELI: "An Improved Search Algorithm for the Design of Multiplierless FIR Filters with Powers-of-Two Coefficients"</p> <p>IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS, vol. 36, no. 7, 1 July 1989 (1989-07-01), pages 1044-1047, XP000054038</p> <p>New York, US</p> <p>page 1045, left-hand column</p> <p>page 1046, left-hand column -right-hand column</p> <p>---</p>	1-4,7-9
A	<p>US 4 791 597 A (KOO DAVID ET AL)</p> <p>13 December 1988 (1988-12-13)</p> <p>abstract</p> <p>column 2, line 9 - line 31</p> <p>column 3, line 43 - line 54</p> <p>column 6, line 34 - line 38; figure 5</p> <p>---</p>	1,4,8,9
A	<p>WO 01 22582 A (KONINKL PHILIPS ELECTRONICS NV ;PHILIPS SEMICONDUCTORS INC (US))</p> <p>29 March 2001 (2001-03-29)</p> <p>cited in the application</p> <p>page 3, line 4 - line 10</p> <p>page 9, line 8 -page 10, line 16; figure 2</p> <p>-----</p>	1,4

INTERNATIONAL SEARCH REPORT

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0766388	A	02-04-1997	KR	248021 B1	15-03-2000
			CN	1391345 A	15-01-2003
			CN	1150722 A ,B	28-05-1997
			EP	0766388 A2	02-04-1997
			JP	9167946 A	24-06-1997
			US	5831880 A	03-11-1998
US 4791597	A	13-12-1988	DE	3788779 D1	24-02-1994
			DE	3788779 T2	30-06-1994
			EP	0266004 A2	04-05-1988
			JP	63160406 A	04-07-1988
WO 0122582	A	29-03-2001	US	6505221 B1	07-01-2003
			EP	1131887 A1	12-09-2001
			JP	2003510876 T	18-03-2003
			WO	0122582 A1	29-03-2001